REMARKS

By this Amendment claim 27 has been amended to include the features of claims 33 and 37 (now canceled), claims 34-36 and 38 have been made dependent on claim 27, and claims 53, 54 and 57-61 have been canceled. Entry is requested.

In the outstanding Office Action the examiner has (1) rejected claims 27-29, 32-36 and 38-48 under 35 U.S.C. 103(a) as being unpatentable over Shimoda in view of Flynn and Andersson, (2) rejected claims 30, 31, 37, 49-52 and 55-57 under 35 U.S.C. 103(a) as being unpatentable over Shimoda in view of Ganser, and (3) rejected claims 53, 54 and 58-61 under 35 U.S.C. 103(a) as being unpatentable over Shimoda in view of Andersson et al.

By way of this Amendment claim 27 has been amended to include the features of claims 33 and 37, so the examiner's first rejection has been rendered moot, and claims 53, 54 and 58-61 have been canceled so the examiner's third rejection has been rendered moot.

With respect to the examiner's second rejection, which for some reason includes canceled claims 30, 31, 55 and 56, since most of these claims depend from claim 27, it is not understood why the Flynn and Andersson references are not included in the rejection since they are included in the rejection of claim 27.

In any event, it is asserted that amended claim 27 and the claims dependent thereon are patentable.

Shimoda et al. disclose an internal combustion engine (in particular a diesel engine) operated according to the HCLI method and wherein the EGR ratio of intake air, injection timing of an injection nozzle, and excess air ratio to fuel are controlled depending on engine operation lead. As discussed in column 7, lines 40-59, at a low to medium load, the timing to start the injection of fuel is initiated at a crank angle of 30° to 10° before top dead center, and the exhaust gas recirculation and rate is as low as 40-60%. In the case of medium to high lead, the fuel injection is initiated at a crank angle of 10° to 0° before top dead center, and the exhaust gas recirculation rate is as high as 50-70%. No mention is made of the injection pressure.

Flynn et al. disclose a premixed charge compression ignition internal combustion engine and a control system which controls temperature, pressure, auto-ignition, ratio control, etc.

Andersson et al. disclose a method of controlling fuel injection in an internal combustion engine wherein post injection of a fluid (e.g., fuel, water, air and/or another gas) at a pressure of 1500-3000 bar subsequent to primary injection of a fuel at 200-1500 bar (column 3, lines 41-52).

Ganser discloses a fuel injection valve which can operate at low pressures, e.g., 200 bar, and high pressures, e.g., at 1000 bar or more.

It seems to be the examiner's position that it would be obvious to apply the "specific injection angle" taught by Flynn, the "specific injection pressure" taught by Andersson, and the "fuel injection pressure" of Ganser in the Shimoda method. However, the applicants assert that this is without merit insofar that Flynn, Andersson and Ganser do not disclose "teachings" that a person of ordinary skill in this art would think to apply to Shimoda, only general discussions of internal combustion engine operating variables. It is not believed that the examiner has set forth a proper *prima facie* rejection.

Amended claim 27 defines specific ranges for initiation of fuel injection, exhaust gas recirculation rate, and injection pressure for various loads on the defined direct injection diesel internal combustion engine. These ranges provide minimum nitrogen oxide and particulate emissions from low loads to high loads which maintaining a high efficiency over the whole range. The cited references, even if combined, do not suggest these claimed ranges.

The examiner's prior art rejections should be withdrawn and the application allowed.

Respectfully submitted,

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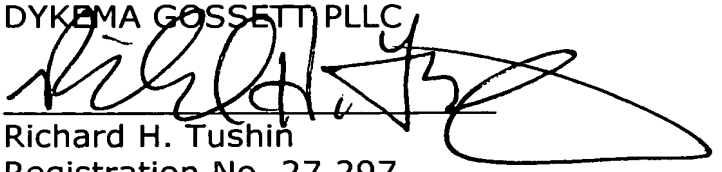
By: 

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